

[Reprinted from THE CLIMATOLOGIST, February, 1892.]

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THE CLIMATE OF THE GREATER PIEDMONT AND MOUNTAINOUS REGIONS OF THE SOUTHERN UNITED STATES.¹

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THE object of this paper is to call attention to a region of our country, the climate of which has not yet been described as a whole. It may be better to attempt a description in a general way, and as a whole, because there are circumstances in the history of a portion of this territory by which it is known as a distinctive region; and the whole section has marked peculiarities of land-formation, air, and climate.

A distinction will be made in the description between the words *climate* and *air*; and for the definition of these words reference will be made to the most recent dictionaries (Billings's, Webster's, Ainsworth's, etc.). In treating such widespread subjects as air and climate it is easy enough to digress; but to take the harder way, and to keep closely to the definitions to which reference has been made, would be simply impossible for the region under our notice, because the extent of country is too great, and there are but few data upon which to base statistics. There are several signal-service stations, with volunteer and agricultural experiment stations established by the National and State Governments scattered throughout this region, the officers of which are always willing to give any information in their power, yet such information could not be relied upon in treating of the climate in a general way.

The description of special climates is generally given by means of tabulated and comparative statements of the thermometer record, the range of the barometer, the dryness or humidity of the air, the force and direction of the winds, etc. For obvious reasons this

¹ Read at the meeting of the American Climatological Association, Washington, September 22, 1891.



plan will not be attempted here notwithstanding the facilities which have been mentioned. In treating this region as a whole, my argument will rather be to show the appearance as to health, and some of the prominent characteristics of its inhabitants; and then to apply a few of the well-known principles which govern the air and climate of all regions to this distinctive locality.

There is no doubt of the fact that climate and scenery have much to do in the formation of human character; and people without knowing it absorb to a great extent the physical attributes of the place in which they live. The most correct description, and the truest appreciation of the climate of any region may be obtained from the appearances presented by its inhabitants. If their faces are happy and tranquil, it is evident that life is pleasant and sweet; if they are industrious and ambitious, contented and satisfied, healthy and beautiful, then it may be inferred that the climate is a good one. Should, however, the reverse appearances maintain for any region the reverse opinion would be given. Surely it is a true philosophy which will judge of the physical surroundings of men by their appearance.

There is the authority of Mr. Henry Gannett, the learned geographer of the United States Geological Survey, for saying that, "the area which is usually defined, at present, as the 'Piedmont Region of the South,' is bounded on the northwest by the Blue Ridge and on the southeast by the Fall line, which passes through Washington, Richmond, Columbia, Augusta, and Macon.

"It is underlaid in the main by granitoid rocks. It rises from an undulating surface in the southeast to detached ranges, terminating in the Blue Ridge on the northwest, and has an elevation of three or four hundred feet on the uplands in the southeast to more than four thousand feet."

This description covers the length and extent of the foothills south of Mason and Dixon's line, east of the Blue Ridge Mountains. There is, however, a piedmont region west of this, extending into Alabama as far as Birmingham and Anniston to which a large emigration is progressing; and yet another region extending along the west side of the Appalachian range, both of which are well worthy of attention. The same general principles govern

the changes in the climates of all these regions, and therefore it is proposed to treat of them as a whole. Whatever information may be obtained or imparted bearing upon them, it is hoped may be well received, because a large emigration is now tending in this direction.

If one stands before the map of the United States issued by the Department of the Interior, which is compiled from actual surveys and is most correct and authentic, it will be seen that the north boundary of this region extends along Mason and Dixon's line which in round numbers runs nearly along the 40th degree of north latitude; and thence along the boundary between Pennsylvania and West Virginia to the fall of the foothills of the mountains of that State. Its western boundary includes the foothills in Alabama and running north through East Tennessee, East Kentucky, and West Virginia.

It lies across the country in a southwesterly direction; the head or eastern portion of it being nearly on the same longitudinal parallel with Washington, and the southern extremity being nearly 10 degrees further west. It runs nearly parallel with the Atlantic coast, and comprises an area of about seventy-five thousand square miles.

Almost within our own knowledge this region has been twice peopled: first, by the Indians; and, second, by the present white inhabitants. Of the Indians the principal tribes were the Catawbias and the Cherokees. Of these the Catawbias were not properly a Piedmont tribe. The Cherokees have been represented by the historians of the various war-campaigns made against them, as brave and powerful warriors, intelligent, subtle, and ingenious in supplying themselves with food in times of peace. They were grain-feeders and descended from the Iroquois. After their defeat by the army under Gen. Andrew Jackson, most of them were removed to more western reservations. Those that remain, however, known as the "Eastern Band of Cherokees," and numbering about three thousand souls, are said by Mr. James Mooney, of the Bureau of Ethnology, and by Dr. Washington Mathews, U. S. A., to be healthy and capable of enduring much exposure and the fatigue of long walks and mountain

climbs. They compare very favorably, by ranking higher in health, than the fish-eating Indians along the sea-coast.

The origin of the white people of this region seems to be almost as mysterious, in another way, as that of the Indians. Let the Rev. Mr. A. D. Mayo, of Boston, tell the result of his study after a residence of ten years amongst them. He says, "How the strange population of this great central mountain world, near two millions at present, was formed nobody seems to know. This region was a mysterious no-man's-land till the enterprise of the last twenty-five years revealed it, with all its natural sublimity and beauty, and its industrial importance, to an astonished world. A most interesting fact for the historical inquirer is the explanation of the origin of the southern white people, and the romance of the reality will eclipse the glamour of rhetorical mist in which the origin of this section has been involved."¹ According to the same authority, however, no matter where they came from, the present inhabitants of this region seem to have grown up with the climate, the air, and the soil with its varied products, to a high place in political and industrial importance. Here was, and is now, the headquarters of what is termed the "Third-Estate of the South, which came in time of war, like a mighty apparition across the southern horizon."

In order to show some of the effects and prominent laws of climate let Mr. Mayo tell what they did: "In the late war," he says, "they were patriotic beyond all other sections. One hundred and forty thousand white soldiers were enlisted from this region. Twenty-four thousand more than from Vermont, New Hampshire, and Connecticut. Seven thousand more than from nine of the present Northwestern States. Eastern Kentucky gave more white soldiers to the Union army than its entire number of voters." The presidents of both the contending sections came from this region, as also a large number of the most distinguished generals and rank-officers. Even in the ante-bellum period the author of the Declaration of Independence, the fourth president of

¹ "The Third-Estate of the South." *Journal of Social Science*, Saratoga Papers of 1890. By A. D. Mayo, D.D.

the United States, and many renowned statesmen came from this section. The first president, the Father of his Country, ever kept his sagacious and practical eye upon the deep valleys of the Kanawha. These individual illustrations are given only to show the real relation of man to his surroundings, because such a record of inhabitants during three distinct epochs, it is believed, point conclusively to an invigorating climate. There is now a steady emigration from the North, South, East, and West to this great region. Maryland is its principal gate through Baltimore and Washington from the North and East; the approach from the South is through Atlanta, and through Louisville and Cincinnati from the West.

In the old South slavery did not take root in this region as it did in the lowlands around it. This peculiar institution shaded off with the slope of its mountains and foothills towards the East, the South, and the West, obeying in this the well-known climatic law, which is common to all mountain regions, that slavery does not flourish among the hills. Besides this, according to another law touching climate and the races of men, there is no necessity, in justice, for the presence hereafter of any other race than the white people in this climate. This is said on account of the great contentions already going on in the Southern States amongst those of different colors and races. The pigmented races flourish equally as well or better elsewhere; and if the white population of this region recognize fully the value of the climatic law which has been given, and promptly act upon it, they will surely pursue a far-seeing and a proper policy, which must add much to the prosperity and happiness of both races in the future by freeing them from all color and race contentions. If there be no mistake in any of the statements which have been made; if the climatic laws as advanced are admitted; if they are all conspicuously true, then it may be said, philosophically, that the great war through which we have passed was, to a considerable extent at least, begun and ended by identically the same genius that brings us together here to-day—the effects of climate upon man—and that this region played no inconspicuous part in its history.

There are, however, certain other atmospheric laws which, when applied to this region, will explain some of the prominent

characteristics of its climate. One of these is a well-established law, that a residence in a moderately-elevated region—that is, on a plane of the atmosphere a few hundred feet above sea-level—is more healthy than the tide-water lands, especially in a warm climate.

2. As we ascend above the sea-level, the mean annual temperature of the atmosphere falls at the rate of one degree for every three hundred feet of ascension.

3. Going towards the North, each geographical degree represents at least one degree of colder mean annual temperature. Of course, these figures are not held as exact in all cases; they are only approximate; yet there is a long experience to confirm their general truth. "The chief factors that determine and modify climate," says Dr. J. M. Toner,¹ "are latitude, altitude, distance from the sea-coast, mountain ranges, and inland lakes. These are positive elements, and very regular in their influence upon climate."

Nearly one-half of the surface territory of Maryland, Virginia, North Carolina, and Georgia has an elevation of less than three hundred feet above the sea-level. From this plane the land rises by terraces until it reaches the Appalachian range, the average height of which is estimated by Dr. Toner to be about two thousand four hundred feet—not high enough to influence the climates of the plains on either side by snow-clad peaks or chilling winds, but sufficiently high to give to the region itself a cool, salubrious, invigorating, and healthful climate.

Starting from Baltimore, which is the gate to Harper's Ferry, the north entrance to this region (the first of the terraces, going towards the northwest) is Parr's Ridge, about eight hundred feet high; secondly, the Blue Ridge Mountains, about twelve hundred feet; then the Appalachian or Alleghany Mountains, the highest peak of which, in this State (Maryland), is about four thousand feet.

Probably the best way to present the climate of so large a region as this, especially where it is homogeneous, is to bring

¹ Dictionary of Elevations and Climatic Register of the United States. By J. M. Toner, M.D., Washington, D. C.

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lobster law*

prominently forward the fact that in all piedmont and mountain countries topography gives many different climates, even in the same latitude of the same range. This results from the circumstance that the hills and mountains lie zigzag upon the surface, so that every possible inclination to the sun may be obtained; also, every degree and prolongation of shade in the morning and in the evening, when the long shadows fall from the neighboring mountains. In all mountainous regions situations may be found that are protected from or exposed to the winds from every direction, so that all these accidental circumstances give different temperatures and humidities to each spur and every valley in the range.

Among mountainous countries, the Alleghany or Appalachian range has its individual peculiarities. Extending as it does in a southwesterly course, nearly parallel with the Atlantic coast from Maine to Alabama, it is eleven hundred and fifty miles long, and from one hundred and fifty to two hundred miles broad. The highest peaks are found near the two extremities—the one in North Carolina, nearly seven thousand feet high; the other in New Hampshire, over six thousand feet high. The region under our consideration, however, extends from the fortieth degree of latitude. South of this, latitude has even more to do in modifying the climate than in the northern part. In the mountains and foothills of Pennsylvania, New York, Vermont, New Hampshire, and Maine, the climate is delightful in summer, but the winters are too rigorous for profitable agricultural pursuits. As a residence for the year round, they bear no comparison to the foothills and mountains of Alabama, Georgia, East Tennessee and Kentucky, West Virginia and Maryland. In these States no two spurs or valleys seem to have exactly the same climate or to give the same flavor and luxuriance to the products of the soil.

Another way of forming a correct idea of this region is by comparing it with other piedmont and mountain climates. In Europe those somewhat in the same latitude—that is along the fortieth parallel—are in Portugal, Spain, and Italy. In these countries the hill and mountain climates do not materially differ from those in the Appalachian range to the South. The mountains of this range are not so high and imposing as those of the Alps, and are not above the snow-line. The valleys are broader,

more fertile and productive, and the landscapes are more smiling and extended. There are no lakes in the Appalachian range, and this gives it at once a singular peculiarity, which, while it may detract from the variety and romance of its scenery, yet, at the same time, may have some effect upon its general climate.

Compared with the Rocky and Sierra Nevada mountains, in the same latitude, the climate and scenery are in yet more marked contrast. The mountains are not so high; the foothills are shorter; the valleys and parks and cañons are more compact than these Western mountains, and the land is more fertile; the air is less rarified; the dew-point and rainfalls are different. For these and other causes, the two climates are dissimilar. So much has been written concerning the climates of Colorado and California, below the fortieth parallel, that the contrast need not be continued further.

Concerning the kind of air found over the piedmont and mountain regions of the Southern States, it may be said that as it is far removed from the ocean, the air differs from that of the sea. It also differs from that of the sea-coast, and from the plains known as the Atlantic slope. Nor is it the same quality of air which is found in the great basins of the Ohio and Mississippi valleys. Standing upon a plain higher than any of those lands, the difference in the air is immediately appreciated by the personal sensitiveness of those who come upon its surface. The air also shows entirely different phenomena from that in the lowlands. One striking peculiarity is the absence of what is known as the ague and fever, or the intermittent and remittent malaria.

The Celli, Laveran's, or Counselman's parasitic organism, so widely spread in the lowlands, has not yet been wafted to or found lodgment in the air of this piedmont or mountain region. According to the map for consumption, published by the United States Census Bureau, the tubercular bacillus (Koch's) does not exist in some portions of this region. The white spot upon the map of the Census Bureau, marking absence of this organism, is found in East Tennessee and West North Carolina, and radiating from this central point the shading of the map is light from Alabama to West Virginia. It is claimed that the typhoid-bacillus is found here as well as upon the prairies of Michigan, but the individual

differences between the two bacilli, if any exists, has not yet been shown.

Treating the climate of this great region as a whole is only admissible because of the sameness of the climate. It does not nor is it intended in any way to forestall or conflict with more special or detailed descriptions of the climate of any of its parts or sections. It has already been said that almost every available residential situation has its own peculiar points of excellence or discomfort, and these must be studied. Personally, I have been in many different parts of this region, and I believe that, allowing for latitude, it has, in a general way, a homogeneous air and climate throughout its entire extent. Its chief characteristics are that it is variable, like other mountain climates; but that this variability is much modified by the moderate height of its hills and mountains. That it is an invigorating and a healthy climate, proof has been offered by a description of three different sets of inhabitants at different epochs. Owing to its topography, any plane for the situation of a residence may be selected, varying from one thousand to several thousand feet above sea-level, and almost any presentation to the sun can be found. One may place his house and plant his vineyard and fruit-orchard away from the force of the north or west winds, and keep warm during the winter by locating in sheltered valleys, or on the sides of hills smiling to the south.

In conclusion, permit me to say that the mountain and piedmont region of the Southern States have climatic and other advantages of peculiar interest. Although much nearer to the cities and people of the Atlantic coast than the foothills and mountains west of the great basin of the Mississippi River, they have not excited, or as yet received, as much interest or study as the Western mountains. The chief attraction to them at present is their untold mineral wealth, which is being rapidly developed. My argument is that this region has many points of attraction connected with its climate, and other resources supplementing its climate, which will be briefly enumerated. The purity of its air, free from periodic fevers, and its comparative freedom from consumption have been mentioned. The climate is bracing and exhilarating, the scenery pleasing, the

land is well watered and the soil fertile, producing food and fruits necessary for the maintenance of a large population without much trouble or expense; its mineral and medicinal springs are numerous, with many well-built health-resorts already improved. Its forests are valuable; upon its surface in some parts there is a natural growth of blue grass (*poa compressa*), which, beyond all competition, brings the ruminating and gramivorous animals to their greatest perfection. In its streams swim fresh-water fish of good quality, and, although remote from the sea, it is becoming each year more easy of access by means of railroads penetrating it in every direction. The climate of the Appalachian region under consideration is eminently variably.

Sometimes there is cloud and sunshine, heat and cold, winds and calms, drouth and rain, all in one day. There have been those who thought that this scene of perpetual atmospheric vicissitudes not only steels us against their effects, but proves an unceasing stimulus to activity of body and mind, and, consequently, to vigor of constitution. There are those who look for more equal climates for the benefit and pleasure of certain individuals, and for the cure of some diseases. One great desire of the present day is to find a dry and equal climate. For this the search is being diligently made with ingeniously invented instruments. Such a climate is wanted, and is a desideratum for a restful, soothing, and healing treatment for many nervous and malignant diseases—for consumption and other wasting and anæmic affections. Such a climate will not be found in the region now before us. In this country one must go to Coronado Beach, Cal., or Point Pinalos, Fla., to find the nearest approach to a mean annual temperature within or about the seventies. The climate of piedmont and mountain ranges having moderate heights, is only recommended to maintain the strength of healthy, strong, and vigorous persons, who can withstand vicissitudes, and delight in such changes amidst beautiful scenery. It is not recommended for the cure of any special disease, nor for the relief of any abnormal condition; but it is recommended as a climate for the strong and vigorous who wish to retain these characteristics in future generations. It has not been presented

in the strained language of poetry or hyperbole, but an effort has been made to describe the climate pure and simple as it exists. So far as the history of its inhabitants has been given, it has shown itself to have been the cradle of intelligent and powerful men and women; people who appreciate the glow of patriotism, the power of wealth, the animation of life in a pure air. They seem content in the pleasure of passing this life amidst ennobling scenery, surrounded by everything which enhances happiness by promoting the health of mind and body. It is believed that in time to come this region will turn out to be the centre of a powerful population, for the air and climate have already been proved to be replete with courage and patriotism.

DISCUSSION.

within DR. KARL VON RUCK. I can confirm what Dr. van Bibber states, in regard to the absence of consumption and malaria amongst the natives of the Asheville plateau, which, ~~however~~, is ~~beyond~~ the piedmont section; but I can hardly agree with him when he says that this climate, which produces such vigorous people, etc., could not be made use of in the cure of disease. In the region where I come from we do make a good use of it in the cure of consumption. In other respects I can heartily indorse the doctor's statements and conclusions.

Published the 15th of each Month.

THE CLIMATOLOGIST.

A MONTHLY JOURNAL OF MEDICINE,

DEVOTED TO THE

Relation of Climate, Mineral Springs, Diet, Preventive
Medicine, Race, Occupation, Life Insurance,
and Sanitary Science to Disease.

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Philadelphia, Pa.